

PATENT APPLICATION

**METHOD FOR SPECIFYING DELIVERY INFORMATION FOR
ELECTRONIC DOCUMENTS**

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CROSS-REFERENCES TO RELATED APPLICATIONS

The present application makes reference to a commonly owned co-pending U.S. Patent Application No. 08/754,721, AUTOMATIC AND TRANSPARENT DOCUMENT ARCHIVING, filed November 21, 1996, incorporated herein by reference in its entirety for all purposes.

BACKGROUND OF THE INVENTION

The present invention relates to a document management system and more particularly to a graphical user interface method and apparatus for assisting a user with the tasks of organizing and distributing documents.

With the rapid development of storage system technology, the cost of storing an image of a sheet of paper on digital media has become less than the cost of printing and storing the sheet of paper itself. Digital document storage also facilitates later electronic search and retrieval and raises the possibility of automatic filing of documents.

Systematic digital document storage requires scanning documents to create digitized document images which can then be stored, distributed and retrieved by electronic means. Scanning occurs constantly in the networked office environment in the contexts of copying and faxing.

These processes traditionally have simple push-button interfaces that enable the user to do little more than initiate the cycle of the scanning mechanism. The user must then indicate to the system using operating system commands or iconic representations a choice of medium upon which the electronic image is to be stored. For example, the user may indicate that a scanner incorporate an electronic image onto a diskette in the diskette drive of a computer attached to the scanner. Similarly, facsimile

equipment can be attached to a computer that can store electronic copies of documents processed through the facsimile machine.

The distribution of documents can be greatly enhanced by providing a direct link from the image acquisition mechanism, be it fax machine, copier or scanner to the end users in a networked office environment. In a commonly owned co-pending U.S. Patent Application No. 08/754,721, AUTOMATIC AND TRANSPARENT DOCUMENT ARCHIVING, inventors Jonathon Hull et. al. describe a method for achieving exactly this result.

However, further gains may be realized by making document management systems even more user friendly. What is needed is a graphical user interface at the image acquisition point of a document management system that enhances the user's ability to distribute electronic copies of document images processed by the system.

SUMMARY OF THE INVENTION

A graphical user interface that presents document destinations in terms of recipient objects readily familiar to the user is provided by the present invention. According to one embodiment of the present invention, a method for specifying delivery information for electronic documents can include the step of displaying a plurality of potential recipients to a user. Responsive to input from the user, the method can select at least one potential recipient from the plurality of potential recipients to form a plurality of selected recipients. The method then performs a scanning operation of a document to form an electronic copy of the document. The electronic copy of the document can be transmitted to the plurality of selected recipients. A step of incorporating the electronic copy of the document into a database belonging to each of the plurality of selected recipients is also included in the method.

Some embodiments can also include the step of sending a notification to the recipients to inform them that the document has been added to their database. This notification can be an email.

Numerous benefits are achieved by way of the present invention over conventional techniques. In some embodiments, the present invention is easier to use than conventional user interfaces. The present invention can provide a way to display a number of destinations for a plurality of documents to the user on a single screen. Some embodiments according to the invention are easier for new users to learn than known

techniques. Because objects in the user interface are readily associated with persons familiar to the user, the learning time required by novice users is decreased and the user interface is more intuitive. These and other benefits are described throughout the present specification.

5 A further understanding of the nature and advantages of the inventions herein may be realized by reference to the remaining portions of the specification and the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 depicts a representative network office environment implementing the user interface to automatic document archiving in accordance with one embodiment of the present invention.

 Figs. 2-6 depict representative embodiments of the user interface in accordance with the present invention.

15 Fig. 7 depicts a representative top-level diagram of a digital copier implementing automatic document archiving in accordance with one embodiment of the present invention.

 Fig. 8 depicts a representative computer system usable for implementing elements of the present invention.

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DESCRIPTION OF THE SPECIFIC EMBODIMENTS

 The preferred embodiment of the present invention displays a person's name or an image of a person on a display screen associated with an automatic document
25 image acquisition mechanism, be it fax machine, copier or scanner. This "personal icon" is a metaphor for the computing resources belonging to a person in the office served by the image capturing device.

 The personal icon is depicted on a display screen associated with an image capturing device for documents, such as a copier, scanner or facsimile machine. In
30 response to a user selecting a particular person's icon, the scanned image of a particular document is sent to a database associated with the user. The personal icon can be generated by any number of methods such as a scanned photograph, or picture taken with a digital camera. A name representation can also be used in some embodiments. This

interface is especially useful when used in conjunction with automated office environments. One example of such an environment is described in U.S. Patent Application Serial No. 08/754,721, entitled, "AUTOMATIC AND TRANSPARENT DOCUMENT ARCHIVING," which is incorporated herein by reference in its entirety for all purposes. Preferably, documents described herein for use with the system include text or images, however other types of documents are also contemplated, such as multimedia documents with audio and video information.

In a presently preferred embodiment, the personal icon interface is presented to the user of a copier or other image acquiring device. It provides a readily familiar selection mechanism to the user, a picture or name of the owner of the recipient computing resource for selecting destinations of electronic copies of documents. By doing so, the expected learning curve for the present system is believed to be low and the expected increase in efficiency of the user is believed to be high. Additionally, the personal icon metaphor can be expected to gain wide acceptance with users because a person's name or face is easy to recognize by most people.

Overall Architecture For Automatic Archiving

Fig. 1 depicts an office machine network implementing automatic document archiving in accordance with one embodiment of the present invention. A network 100 may be implemented in any way, e.g., an Ethernet. Network 100 interconnects a representative client system 102, a print server 104, a special digital copier 106, a document management workstation 108, and a special facsimile machine 110. Print server 104 controls printing on a representative printer 112 at the request of client system 102 and relays document image data characterizing to document management workstation 108 for archiving. Digital copier 106 copies documents and transmits image data obtained during the course of copying to document management workstation 108 for archiving. Similarly, facsimile machine 110 captures image data during the course of sending and receiving documents and transmits the image data to document management workstation 108 for archiving. Document management workstation 108 collects the document image data collected from all of the office equipment and maintains an archive on a disk storage unit 114. Client system 102 may browse this archive.

The configuration of network 100 is of course only representative. For example, automatic archiving of documents may be implemented with only one or two types of office machines instead of the depicted types. Also, functionality of one or more units shown in Fig. 1 may be combined into the same unit or divided among many units.

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Automatic Archiving of Copied Documents

In accordance with one embodiment of the present invention, digital copier 106 creates electronic copies of documents that are copied. Fig. 2 depicts a simplified representation of a portion of a personal selection interface 200 usable with digital copier 106. Digital copier 106 is interconnected to document management workstation 108 that performs storing via network 100. Network 100 also provides a distribution medium for electronic copies of documents created by digital copier 106.

Fig. 3 illustrates the contents of personal selection interface 200 associated with copier 106 of Fig. 2, according to a preferred embodiment of the present invention. Personal selection interface 200 has a display area 304 that includes one or more person's iconic representation, each iconic representation associated with the computing resources of a person to whom an electronic copy of the document can be delivered. For example, personal icon 310, bearing the name "Marko Balabanovic" can be selected to distribute an electronic copy of a document processed by digital copier 106 to Marko Balabanovic's database. Some iconic representations can also be associated with functions. For example, icon 360 allows the user to select the function "send to a group." Some embodiments can also include items such as a menu bar, a status bar, one or more tool bar buttons in a tool button area 374, such as button 376, a horizontal scroll bar 370 and a vertical scroll bar 372. In the present preferable embodiment, a tactile sensitive display screen enables the user to enter her selections of particular persons using the personal selection interface 200.

Fig. 4 illustrates the process of accessing the system by a particular user. In Fig. 4, the user has logged on to the copier. In response, a status area 380 displays a personal icon of the user 382. Additionally, a second personal representation of the user, a text name 384 is also displayed in status area 380. This user information confirms the user currently authorized to use digital copier. As illustrated in Fig. 4, the user can then access the digital copier and distribute electronic copies to individuals selected using the personal icons. As described, the personal selection interface and each of the personal

icons 310-352 are metaphors which provide an easy and intuitive way for users to manipulate electronic documents in the networked office environment. The presently preferred embodiment of the invention contemplates any number of personal iconic representations.

5 Fig. 5 illustrates another representative embodiment of the person selection interface 502 having personal selection icons 510, 512, 514, 516, 518 and 520. These personal icons are pictures of the persons associated with particular computing resources. In some embodiments, these computing resources include one or more databases. The user can select the destination databases by touching the tactile sensitive display in the
10 area of the picture of the recipient.

 Fig 6. illustrates another embodiments that combines the picture personal icons with name representations.

 Details of the hardware for the copying and archiving processes will be made clearer with reference to Figs. 7-8.

15 Fig. 7 depicts a top-level diagram of digital copier 106 implementing automatic document archiving in accordance with one embodiment of the present invention. Digital copier 106 includes a scanner engine 702, a print engine 704, a controller 706, a touch screen 708, and an internal disk storage unit 710. Controller 706 includes a DRAM unit 712, an LZ image compressor 714, a CPU 716, an IDE controller
20 718, a SCSI controller 720, and a network interface 721. A bus 723 interconnects the controller elements. Scanner engine 702 includes a scanner 702A and an image processing unit 702B. A video bus 724 interconnects scanner engine 702 and print engine 704. An image data tap 726 provides controller 706 with access to image data transferred over video bus 724. Controller 706 also takes advantage of an HSYNC signal
25 707 and a VSYNC signal 711 generated within print engine 704.

 Digital copier 106 accepts a document 728 and prints a copy 730 upon depression of Start/Copy key 206. Scanner 702A captures an image of document 728 and transmits the image to image processing unit 702B. Image processing unit 702B operates to remove distortion inherent in the scanning process. The output of the image processing
30 unit is preferably in a format where 8 bits represent the grey-scale level of a pixel, there are 4380 active pixels per line, and there are 3380 active lines per frame or document page. There is a 10 pixel blanking period before and after each active line, making the total number of pixels per line, 4400. Similarly, there is a 10 line blanking period before

and after every frame, making the total number of lines in a frame 3400. Of course, these parameters are only design choices.

This pixel data is forwarded from image processing unit 702B to print engine 704 for printing. The data rate over video bus 724 is preferably 20 MHz.

5 Controller 706 monitors video bus 724 via image data tap 726 to receive the same pixel data. Although, it would be possible to monitor the pixel data prior to image processing unit 702B, the advantage to monitoring on video bus 724 is that image processing unit 702B is tightly coupled to scanner 702A and can monitor and correct for errors inherent in the scanning process.

10 Controller 706 performs overall control functions for digital copier 106 including the archiving functions. CPU 716, an Intel 80960 CF microcontroller, operates the control program for the operation of digital copier 106. Image data is often transferred into controller 706 at a faster rate via image data tap 726 than the image data can be archived. Accordingly, DRAM unit 712, preferably incorporating 8 to 72 MB of
15 DRAM, acts as a buffer for image data. This allows printing of the copy to continue without interruption by the archiving process.

To save on storage space and facilitate faster data transfer across network 100, LZ image compressor 714 may compress the image data prior to archiving in accordance with the Lempel-Ziv image compression format. Of course, any image
20 compression format may be chosen in accordance with the invention. With each block of image data to be archived, controller 706 incorporates the user ID data received from touch screen 708.

The actual archiving of document images may occur either locally or remotely. Controller 706 may maintain the archive on disk storage unit 710, in which
25 case the image data will be transferred via IDE controller 718. The archive may also be maintained either internally or externally on SCSI drives to which image data is transferred via SCSI controller 720. Note, that if the archive is maintained on disk storage unit 710, or a disk drive accessible via SCSI controller 720, digital copier 106 will absorb some or all of the functionality of document management workstation 108. If the
30 archive is maintained on document management workstation 108, network interface 721 sends the image data there via network interface 100 along with the user ID data for each particular document. Typically, LZ image compressor 714 is used in applications where documents are archived locally as opposed to remotely.

Document Management Workstation

Fig. 8 depicts a computer system 810 usable for implementing any one or more of client system 102, print server 104, or document management workstation 108 in accordance with one embodiment of the present invention. Computer system 810 includes bus 812 which interconnects major subsystems such as central processor 814, system memory 816, input/output (I/O) controller 818, external device such as display screen 824 via display adapter 826, serial port 828, keyboard 830, fixed disk drive 114 via a storage interface 832, a serial port 834, a CD-ROM player 836, and a floppy-disk drive 838. A mouse 840 may connect to serial port 828. A network interface 842 for connection to network 100 may connect to serial port 834. CD-ROM player 836 receives a CD-ROM disk 844. Floppy-disk drive 838 receives a floppy disk 846. Many other devices or subsystems (not shown) may be connected in a similar manner. Also, it is not necessary for all of the devices shown in Fig. 8 to be present to practice the present invention, as discussed below. The devices and subsystems may be interconnected in different ways from that shown in Fig. 8. The operation of a computer system such as that shown in Fig. 8 is readily known in the art and is not discussed in detail in the present application. Source code to implement elements of the present invention may be operably disposed in system memory 814 or stored on storage media such as fixed disk 830, floppy disk 846, or CD-ROM 844.

Conclusion

In the foregoing specification, the invention has been described with reference to a specific exemplary embodiments thereof. Many changes or modifications are readily envisioned. For example, changing the size or arrangement of the button representations on the display, changing the appearance and features of the displayed images; adding audio effects to indicate that the display has detected an input, among other changes, are included within other embodiments of the present invention.

The specification and drawings are, accordingly, to be regarded in an illustrative rather than in a restrictive sense. It will, however, be evident that various modifications and changes may be made thereunto without departing from the broader spirit and scope of the invention as set forth in the claims.